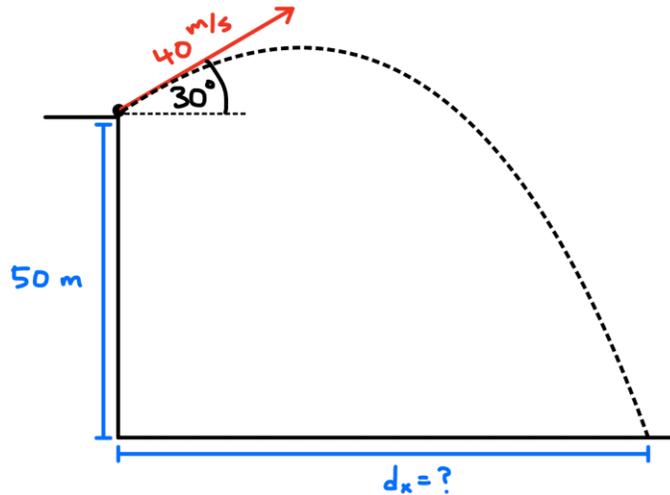# More Projectiles Launched at Angles

1) A projectile is launched from a 50 m high cliff with a velocity of 40 m/s 30° above the horizontal.

    a) What are the initial speeds vertically and horizontally?
    b) How long is the projectile in the air?
    c) What is the horizontal distance travelled by the projectile?
   d) What is the impact velocity?

2) Anna throws a ball from a 8.0 m high tower towards Bobby at a velocity of 10 m/s 20° below the horizontal.

    a) What are the initial speeds vertically and horizontally?
    b) How long is the ball in the air?
    c) How far from the tower should Bobby stand to catch the ball?
    d) What is the velocity upon impact?
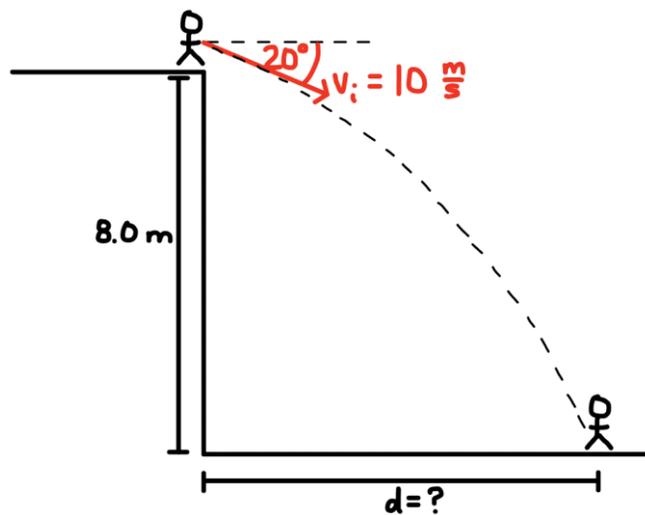
3) A rock is thrown from the top of a 10 m high building at a velocity of 10 m/s 37º above the horizontal. A 6 m tall tree is 12 m from the building.

    a) What are the initial speeds vertically and horizontally?
    b) How long is the rock in the air?
    c) What is the horizontal distance travelled by the rock?
    d) What maximum height above the ground does the ball reach?
    e) What is the velocity upon impact with the ground?
    f) Will the rock make it over the tree?
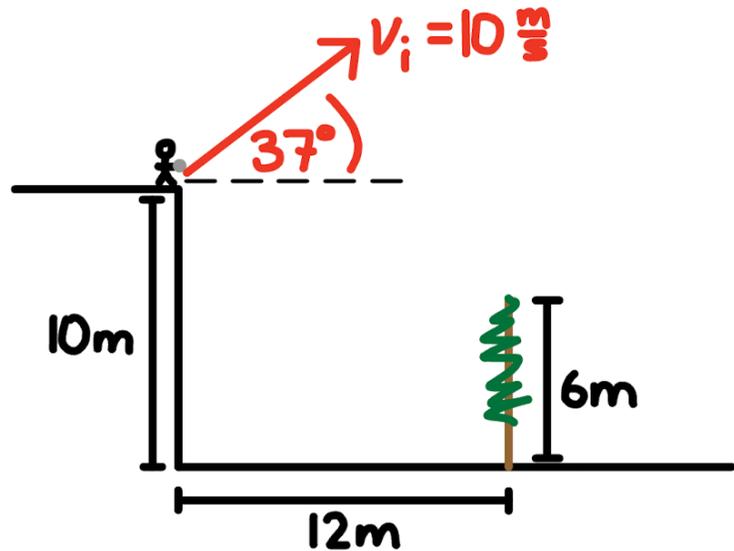
4) A catapult flings a rock from a castle wall of height 60.0 m. The initial velocity of the rock is 80.0 m/s at an angle of 25° above the horizontal.

    a) Sketch the setup of the catapult showing the location of the catapult, castle wall and rock.
    b) What are the initial speeds vertically and horizontally?
    c) How long is the rock in the air?
    d) What is the horizontal distance travelled by the rock?
    e) What maximum height above the ground does the ball reach?
    f) What is the velocity upon impact?
    g) If there is a 75 m high tree along the flight path 76 m from the wall, will the rock clear the tree? If so, by how much?